UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 27611

PLYMOUTH AVENUE

OVER THE

MISSISSIPPI RIVER

DISTRICT 5 - HENNEPIN COUNTY, CITY OF MINNEAPOLIS

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 2255 (CEI 117)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge 27611, Piers 1 through 3, were in overall good condition with no defects of structural significance observed. A scour depression with two locations of footing exposure was observed at Pier 2. A scour depression was also observed at Pier 3, but with no footing exposure. A moderate accumulation of timber debris was observed along the east face of Pier 3. Aside from the scour, the channel bottom appeared stable and was comparable to what was last noted.

INSPECTION FINDINGS:

(A) A moderate accumulation of timber debris was observed along the east face of Pier 3. The debris consisted of a 2 foot diameter log and random 6 to 12 inch diameter timber drift.

(B) A scour depression was observed from the upstream nose to the downstream nose and all along the west face of Pier 2. The scour had a radius of 8 feet and a maximum depth of 3 feet. The scour had exposed the pier footing at the upstream nose and for 30 feet along the west face of the pier with 1 inch and no vertical face exposed on the footing, respectively, at the two locations of exposure.

(C) A scour depression with an 8 foot radius was observed at the upstream end of Pier 3 with a maximum depth of 3 feet. There was no related footing exposure.

RECOMMENDATIONS:

(A) Monitor the footing exposure and scour at Pier 2 and local scour at Pier 3, and if found to be increasing in the future, countermeasures may become warranted based on the findings of the scour analysis/rating done in 1996.

(B) Monitor the accumulation of timber debris at Pier 3, and if found to be increasing in the future, removal operations may become warranted.

(C) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 27611

Feature Crossed: The Mississippi River

Feature Carried: Plymouth Avenue

Location: District 5 - Hennepin County

Bridge Description: The superstructure consists of five spans of two concrete box girders. The superstructure is supported by two reinforced concrete abutments and four reinforced concrete piers. The piers are numbered 1 through 4 starting from the west end of the bridge. The abutment and pier footings are supported by timber piles.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker, P.E.

Dive Team: Michelle D. Koerbel, Clayton G. Brookins

Date: September 29, 2002

Weather Conditions: Cloudy, "55E F

Underwater Visibility: "0.5 Feet

Waterway Velocity: "1 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 through 3.

General Shape: The piers consist of oblong concrete rectangular shafts with rounded ends, that are supported on rectangular footings founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 19 feet.

4. WATERLINE DATUM

Water Level Reference: Benchmark Elevation 804.7 at Pier 1.

Water Surface: The waterline was approximately 5.7 feet below reference.
Waterline Elevation = 799.0.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

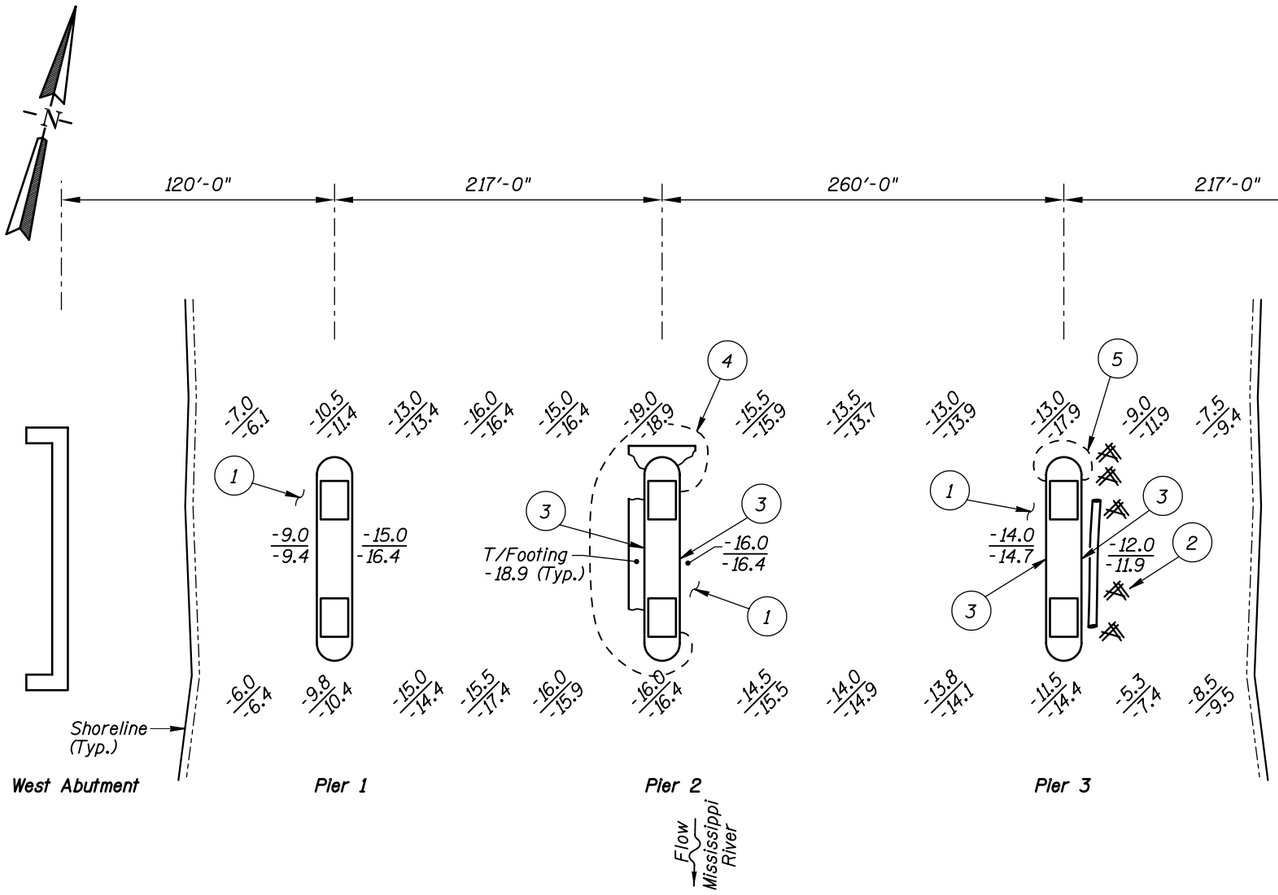
Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/09/02

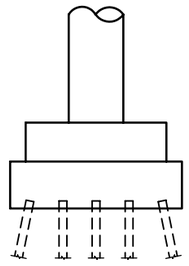
Item 113: Scour Critical Bridges: Code N/96

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes __X__ No



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 1 through 3 were inspected underwater.
2. At the time of inspection on September 29, 2002 the waterline was located approximately 5.7 feet below the Benchmark reference at Elevation 804.7 marked on Pier 1. Based on the reference this corresponds to a waterline elevation of 799.0.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) The channel bottom material consisted of silty sand and gravel with up to 8 inches of probe rod penetration.

(2) A moderate accumulation of timber debris was observed along the east face of the pier. The debris consisted of a 2 foot diameter log and random 6 to 12 inch diameter debris.

(3) A vertical hairline crack was observed from the top of the web wall to the waterline.

(4) A scour depression was observed from the upstream nose to the downstream nose and all along the west face of the pier. The scour had a radius of about 8 feet and a maximum depth of 3 feet. The scour had exposed the pier footing at the upstream nose and for 30 feet along the west face of the pier with 1 inch and no vertical face exposed on the footing, respectively, at the two exposure locations.

(5) A scour depression with an 8 foot radius was observed with a maximum depth of 3 feet.

Legend

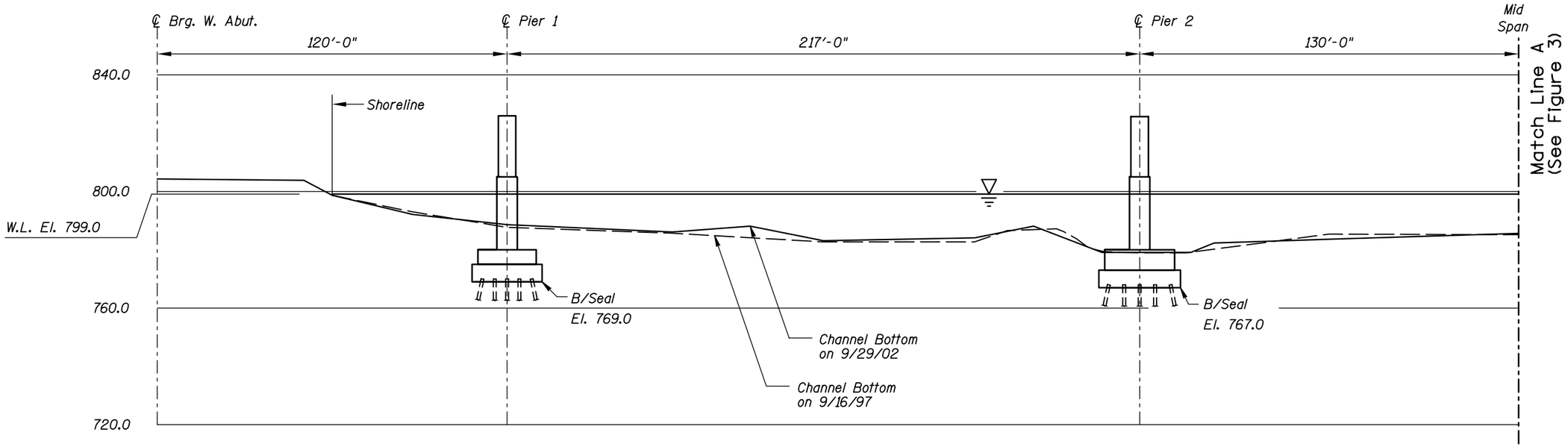
-2.0 / -5.2	Sounding Depth from Waterline (9/29/02) / Sounding Depth from Waterline (9/16/97)
	Scour Depression
	Timber Debris

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

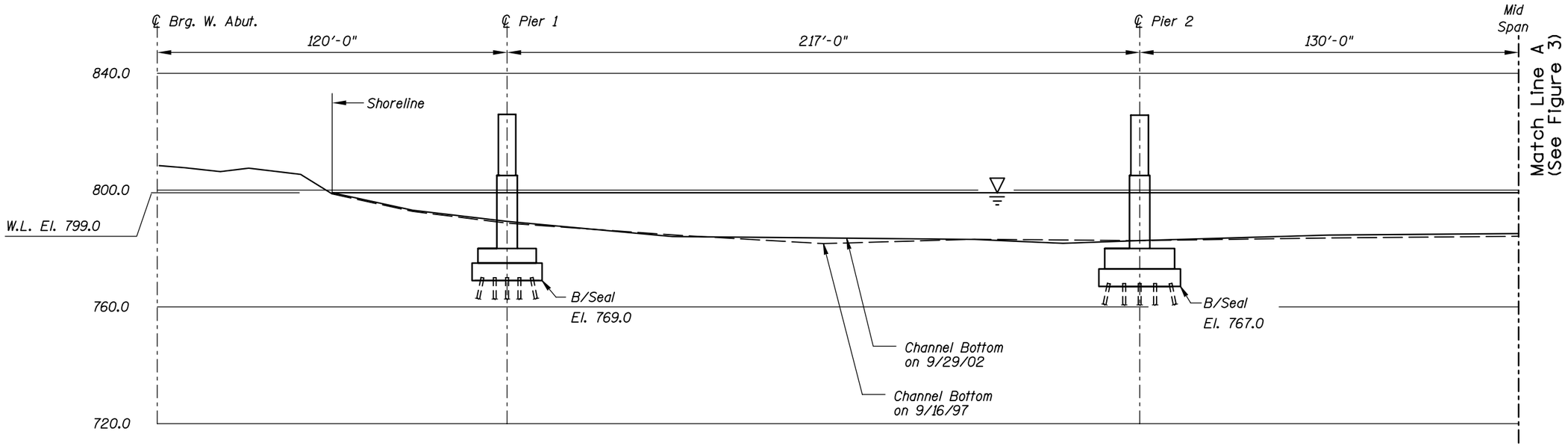
STRUCTURE NO. 27611
OVER THE MISSISSIPPI RIVER
DISTRICT 5, HENNEPIN COUNTY, CITY OF MINNEAPOLIS

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: SEPT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35120117		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
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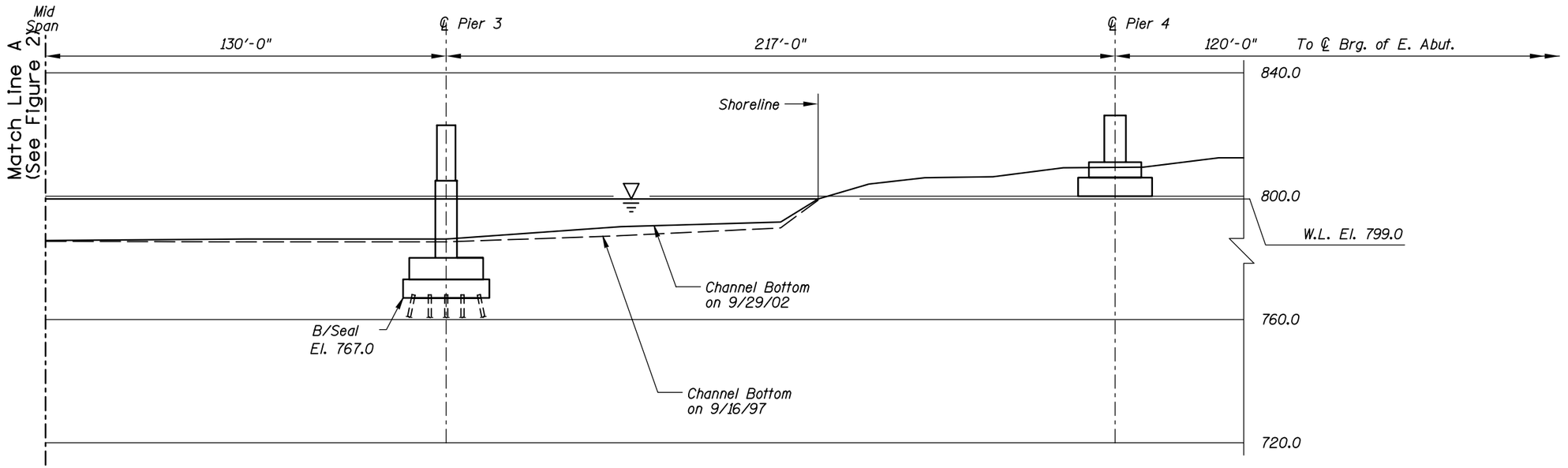
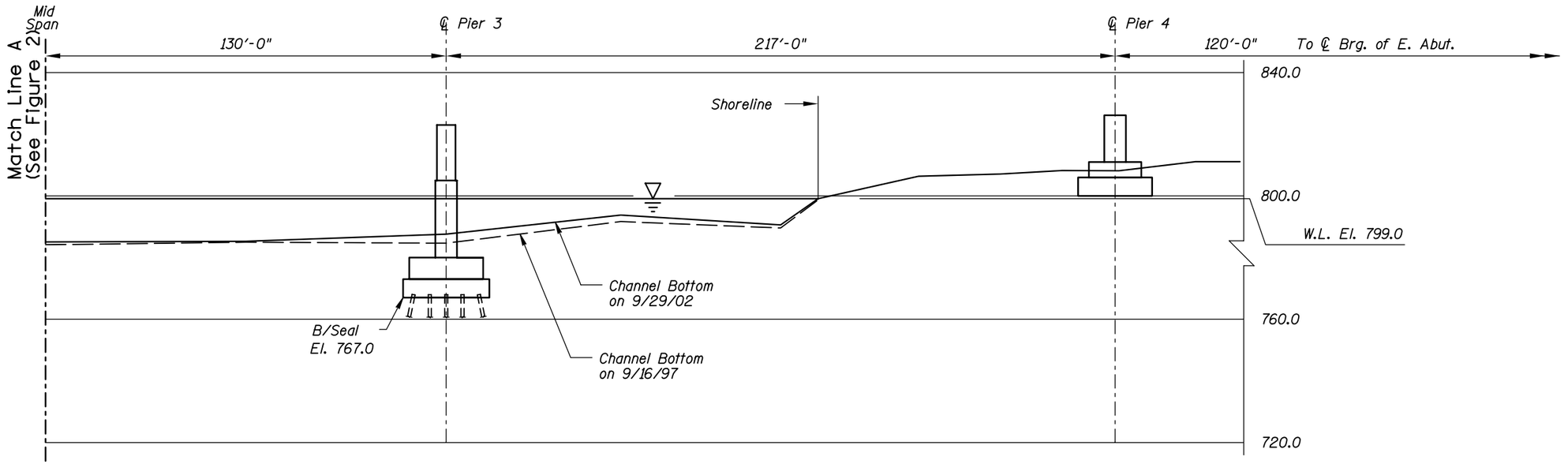
STRUCTURE NO. 27611
OVER THE MISSISSIPPI RIVER
DISTRICT 5, HENNEPIN COUNTY, CITY OF MINNEAPOLIS

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: SEPT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: 1"=40'
Code: 35120117		Figure No.: 2



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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UNDERWATER BRIDGE INSPECTION

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UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: SEPT. 2002
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Code: 35120117		Figure No.: 3

Photograph 1. Overall View of the Structure, Looking North.

Photograph 2. View of Pier 1, Looking Southeast.

Photograph 3. View of Pier 2, Looking Northwest.

Photograph 4. View of Pier 3, Looking Northeast.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: September 29, 2002
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.
BRIDGE NO: 27611 WEATHER: Cloudy, "70E F
WATERWAY CROSSED: The Mississippi River
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER
PERSONNEL: Michelle D. Koerbel, Clayton G. Brookins
EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod, Boat, Camera
TIME IN WATER: 12:20 p.m.
TIME OUT OF WATER: 1:00 p.m.
WATERWAY DATA: VELOCITY "1 f.p.s.
VISIBILITY "0.5 feet
DEPTH 19 feet maximum at Pier 2
ELEMENTS INSPECTED: Piers 1 through 3
REMARKS: A scour depression with two locations of footing exposure was observed at Pier 2. A scour depression was also observed at Pier 3, but with no footing exposure. A moderate accumulation of timber debris was observed along the east face of Pier 3. The debris consisted of a 2 foot diameter log and random 6 to 12 inch diameter timber drift. The concrete of the pier shafts was smooth and in sound and good condition with no notable defects.

FURTHER ACTION NEEDED: X YES _____ NO

Monitor the footing exposure and scour at Pier 2 and local scour at Pier 3, and if found to be increasing in the future, countermeasures may become warranted based on the findings of the scour analysis/rating done in 1996.

Monitor the accumulation of timber debris at Pier 3, and if found to be increasing in the future, repair operations may become warranted.

FURTHER ACTION NEEDED (CONTINUED)

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 27611
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The Mississippi River

INSPECTION DATE September 29, 2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	15.0’	N	8	N	9	N	8	8	7	8	8	8	8	N	N	9	N	N
	Pier 2	19.0’	N	7	8	9	N	7	6	N	N	8	6	8	N	N	9	N	N
	Pier 3	14.0’	N	7	N	9	N	7	6	8	8	6	6	8	N	N	9	N	N

*UNDERWATER PORTION ONLY

REMARKS: A scour depression with two locations of footing exposure was observed at Pier 2. A scour depression was also observed at Pier 3, but with no footing exposure. A moderate accumulation of timber debris was observed along the east face of Pier 3. The debris consisted of a 2 foot diameter log and random 6 to 12 inch diameter timber drift. The concrete of the pier shafts was smooth and in sound and good condition with no notable defects.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.